April 28, 1925. 1,535,509

P. URSINO

EXCAVATING APPARATUS

Filed May 29, 1924 3 Sheets-Sheet 1

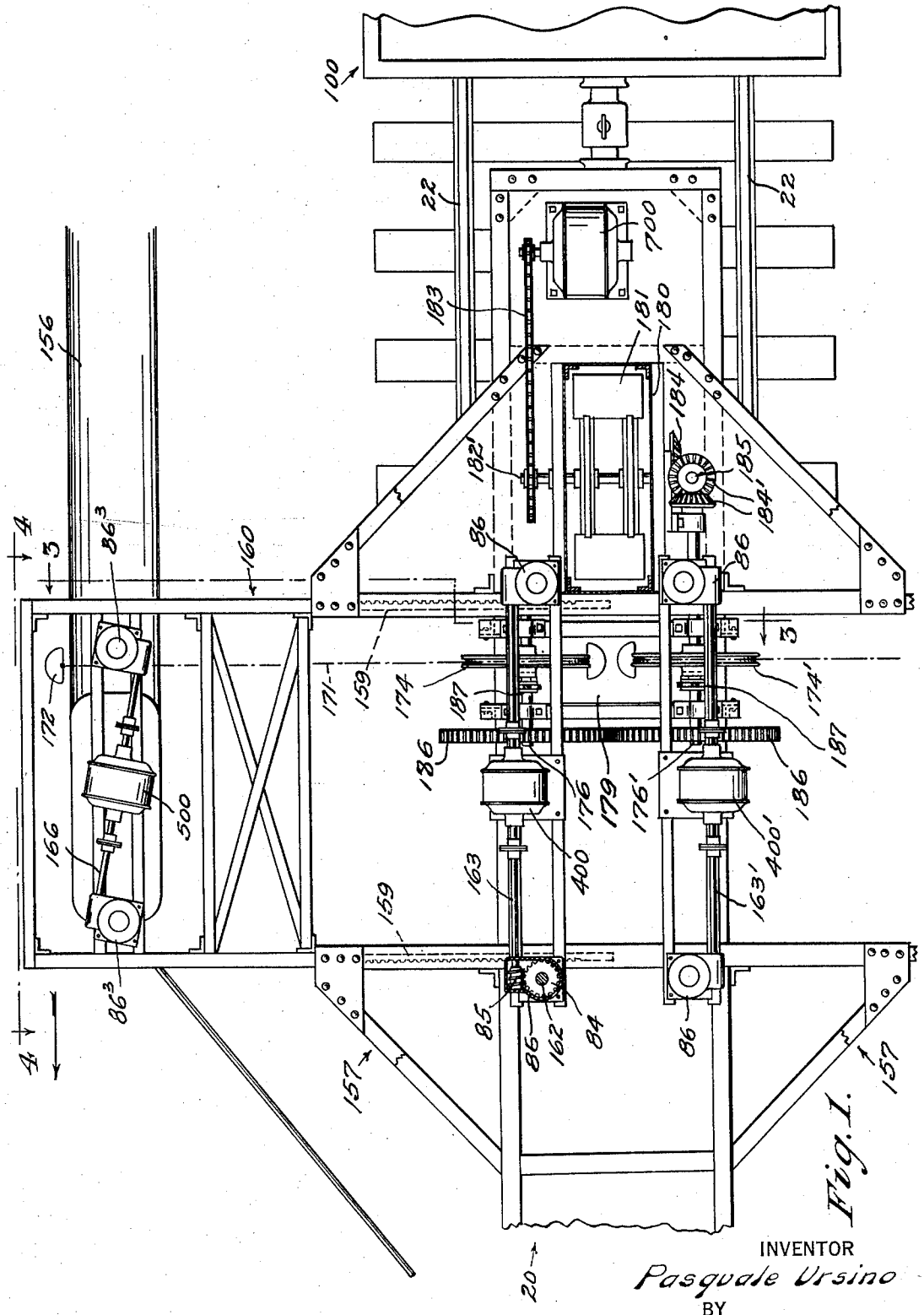



Fig. 1.

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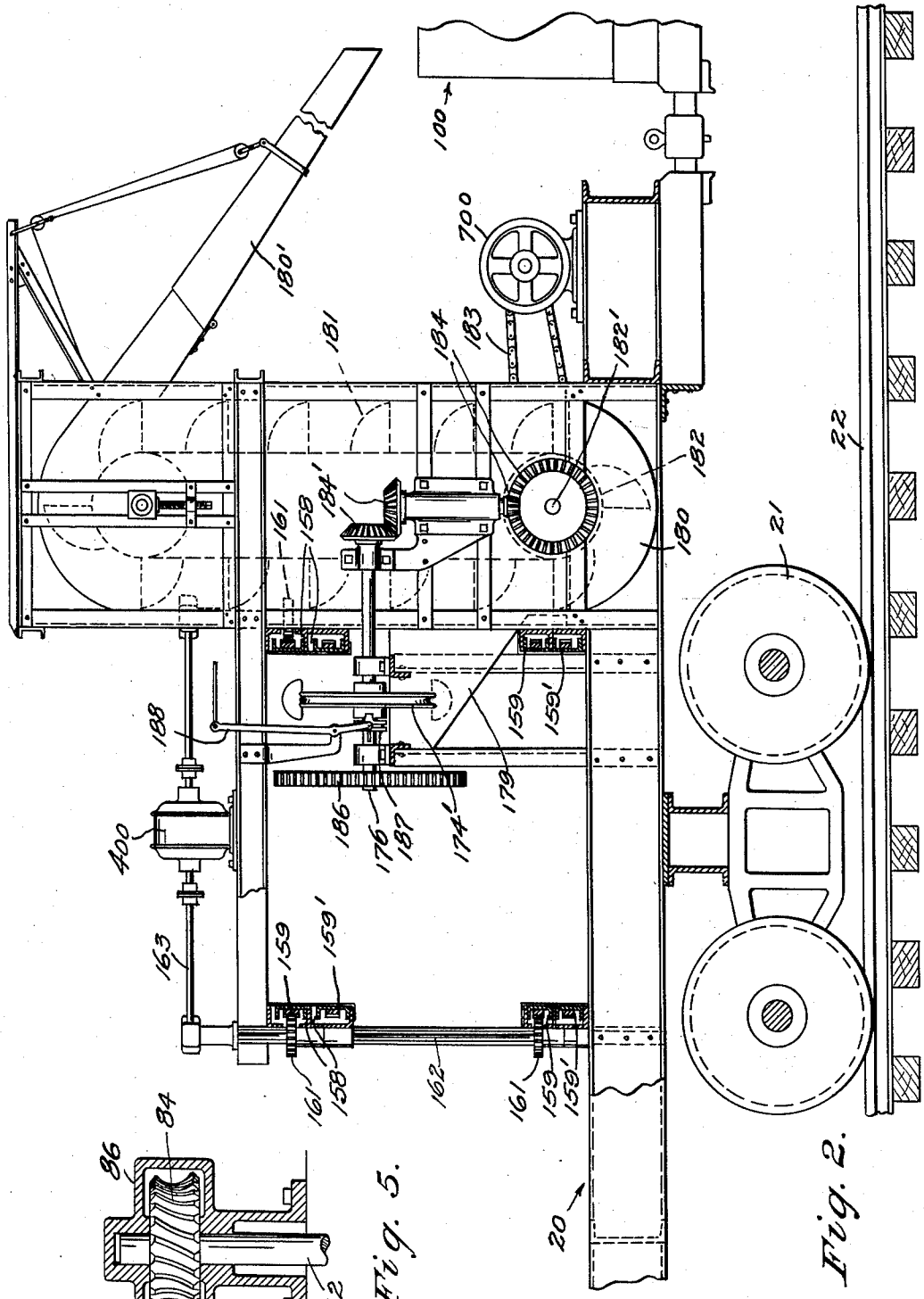



Fig. 2.




Fig. 5.

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Fig. 4.

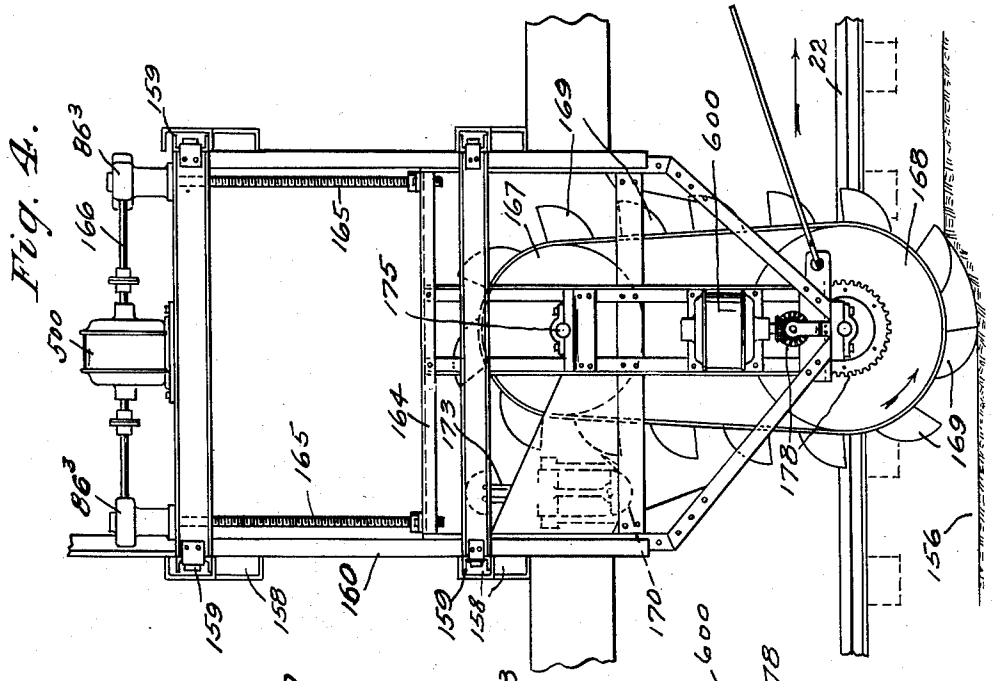
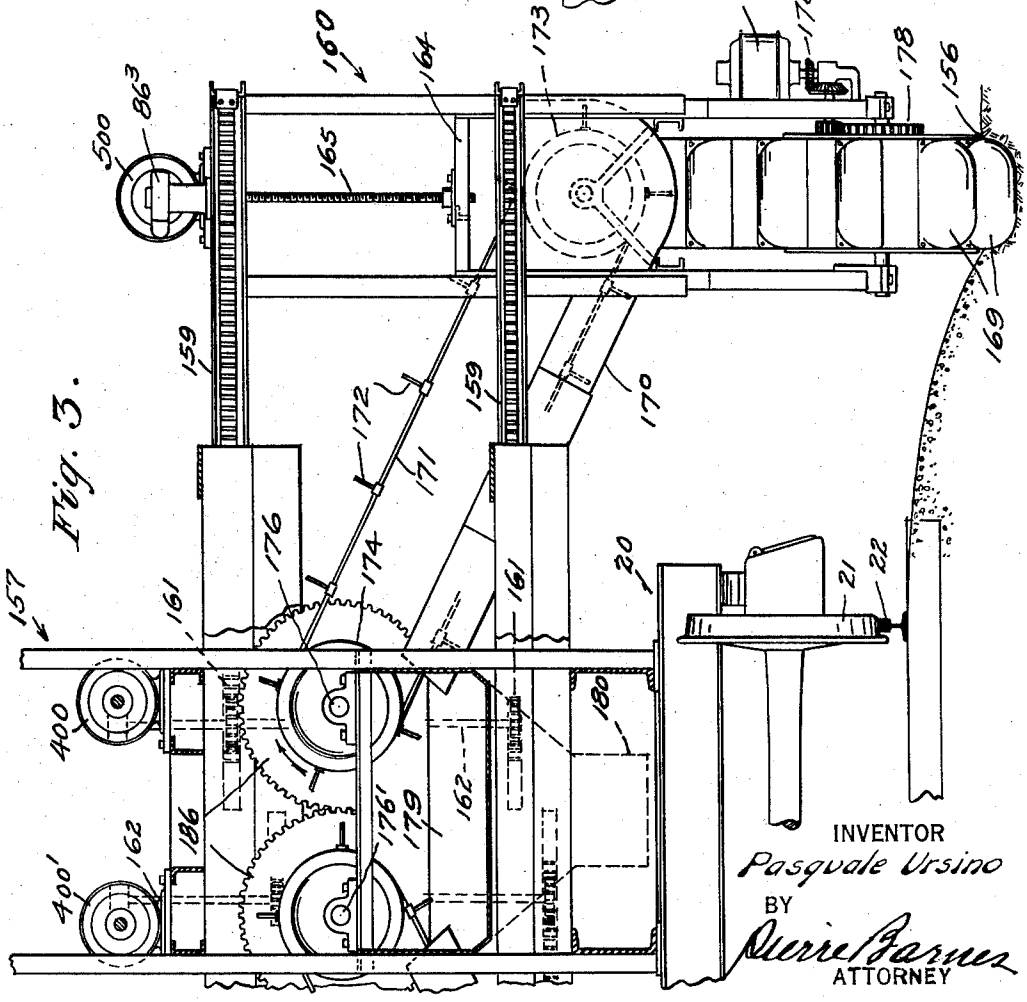



Fig. 3.




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# UNITED STATES PATENT OFFICE.

PASQUALE URSINO, OF SEATTLE, WASHINGTON.

## EXCAVATING APPARATUS.

Application filed May 29, 1924. Serial No. 716,562.

*To all whom it may concern:*

Be it known that I, PASQUALE URSINO, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Excavating Apparatus, of which the following is a specification.

This invention relates to machines for digging gutters or drains at the outer sides of railway track ballast and for disposing of the excavated material.

The object of the present invention is the provision of a machine of the character above referred to which will be more efficient, and rapid than other devices hitherto in use.

More specific objects and advantages of the invention will appear in the following specification.

The invention consists in the novel construction, adaptation and combination of parts hereinafter described and claimed.

In the accompanying drawings,—

Figure 1 is a plan view of devices embodying my invention shown applied with certain parts omitted. Fig. 2 is a side elevation, partly in section, of Fig. 1. Fig. 3 is a transverse vertical section on line 3—3 of Fig. 1. Fig. 4 is an elevational view taken substantially from plane indicated by line 4—4 of Fig. 1. Fig. 5 is a detail vertical section through one of the housings of the worm and worm-wheel mechanisms shown in the preceding views.

In said drawings, the reference numeral 20 indicates the body of a railway car mounted upon wheels 21 which run on track rails 22.

Said car is designed to be drawn by a locomotive although, if desired, it may be equipped with motor driven propelling devices.

In carrying out the present invention, there is provided rigid with the car body 20, a frame work indicated generally by 157 which is provided with guide-ways 158 for transversely arranged beam elements 159 and $159^1$ of outrigger frames, such as 160, provided at the opposite sides of the car. Said beam elements are provided with rack teeth which are engaged by spur pinions 161 mounted upon vertical shafts 162 which are driven from the shafts 163 and $163^1$ of motors 400 and $400^1$ for the right and left hand outriggers, respectively.

Each of said outriggers is provided with guideways for a vertically movable frame, such as 164, which is raised or lowered by means of screws 165 taking in threaded bosses of said movable frame, said screws being driven through the medium of worm wheels and worms, provided in housings $86^3$, from the shaft 166 of a motor 500.

A frame 164 carries pulleys 167 and 168 about which passes an endless belt equipped with buckets 169 whereby the gutter as 156 is dug and the material excavated therefrom is raised and deposited in the lower end of a trough 170, shown in Figs. 3 and 4, of a conveyor.

This conveyor comprises an endless cable or chain 171 carrying buckets 172 and passing around pulleys 173 and 174 respectively mounted on the shaft 175 of the pulley 167 and a shaft 176 which is journaled in bearings on the frame 157 provided on the car. As shown, the gutter digger is driven by means of a motor 600 through the medium of gears 178 and a shaft intermediate the motor shaft of the pulley 168.

The vertically movable frame 164 is adjustable with the associated frame 160 laterally of the car by means of said rack 159 and pinions 161 and to accommodate such adjustments, the trough 170 is formed of telescopically connected parts as shown in Fig. 3.

The excavated material is deposited by said conveyor into a hopper 179 whence it is delivered into the lower end of a casing 180 (see Fig. 2) containing a chain or belt elevator 181 of known or suitable construction for delivering the material into a chute $180^1$ to be discharged into a second car which is indicated by 100.

The driving pulley 182 of said elevator is rotated by means of a chain 183 driven from a motor 700 provided on the car. The conveyor 170 at either side may be driven by independent motors or, as shown, by means of gearing 184 connecting the driving shaft $182^1$ of said elevator with a shaft 185 which, in turn, is operatively connected by means of gearing $184^1$ with the shaft $176^1$ of one of said conveyors.

Motion is transmitted by means of spur gear 186 from the shaft 176[1] to the corresponding shaft 176 of the other conveyor.

The conveyor pulleys 174 and 174[1] are mounted to rotate independently upon their respective shafts 176 and 176[1] and are coupled therewith by means of clutches, the shiftable member 187 of each being controlled by means of a lever such as 188 in Fig. 2, to permit the conveyor at either side of the car to be idle while the conveyor at the opposite side is operated.

In operation, the car in traveling upon the track causes the excavating buckets 169 to dig material from its path and elevate such material into the trough 170 whereupon the conveyor 171—172 operating in the trough transmits the material into the hopper 179.

This hopper feeds the material into the bottom of the casing of the elevator 181 and is by the latter deposited into the chute 180[1] for delivery into a receiving car 100.

While I have illustrated and described the invention as applied to gutter digging, it may be used for grading purposes at either side of the railway track.

What I claim, is,—

1. The combination with a wheeled vehicle, a framework rigid therewith, an elevator provided on the car, of a frame mounted upon said framework for movements laterally of the vehicle, a second frame connected to the aforesaid frame for vertical adjustments, excavating apparatus, means to operate said excavating apparatus, a conveyor to convey material excavated by said apparatus to said elevator, operative connection between said elevator and the conveyor, means to operate said elevator, and a discharge spout provided for the elevator for delivering material therefrom.

2. The combination with a wheeled vehicle, of a framework rigid therewith, a frame mounted upon said framework for movements laterally of the vehicle, excavating apparatus carried by said frame and arranged for vertical adjustments, means to operate said excavating apparatus, a hopper provided on said vehicle, a conveyor for conveying to said hopper material excavated by said apparatus, a discharge spout, and an elevator for transferring to said spout material delivered by the conveyor into the hopper.

3. The combination with a wheeled vehicle, of an elevator, a casing provided on the vehicle for said elevator, a discharge spout for said casing, a hopper provided on the vehicle and having an outlet communicating with the lower end of said casing, a vertically adjustable excavating apparatus provided at one side of the vehicle and arranged for lateral adjustment with respect to the vehicle, a conveyor for conveying to said hopper material excavated by said apparatus, means to drive said apparatus, and means to drive said elevator and said conveyor.

4. In a machine of the character described, a wheeled vehicle, an elevator mounted thereon, means to operate the elevator, excavating apparatus carried by the vehicle at one side thereof and arranged for vertical and lateral adjustments with respect to the vehicle, a hopper provided on the vehicle and having a discharge opening leading to the elevator, an extensible trough extending from said hopper to the excavating apparatus, and a conveyor arranged for conveying excavated material through the trough to said hopper.

5. In a machine of the character described, a wheeled vehicle, a hopper provided on the vehicle, framework rigid with the vehicle, frames mounted in said framework for movements laterally of the vehicle, means to effect laterally movements of the frames, excavators guided for vertical movements in the respective frames, means for effecting vertical adjustments of the respective excavators, means for driving either of said excavators selectively, conveyors for conveying material from either of said excavators to said hoppers, and means to drive said conveyors.

Signed at Seattle, Washington, this 23rd day of May 1924.

PASQUALE URSINO.

Witness:
PIERRE BARNES.